Residuals Characterization for Arsenic Removal Technologies

Michelle Frey[1], Michael MacPhee[1], Joseph Bernosky[1], and Krista Clark[2]

1 McGuire Environmental Consultants, Inc., Denver, Colorado

2 Association of California Water Agencies, Sacramento, California

The revised Federal arsenic MCL of 10 µg/L will have significant impacts on water utilities throughout the US and, in particular, in the State of California that will need to install or modify treatment to remove arsenic. These impacts will be manifest in terms of greater capital and operational costs, as well as increased system operational complexity. *Cost impacts facing California utilities will be sharply higher than those facing systems with comparable arsenic treatment needs in the rest of the country as identified by USEPA in their recent deliberations of the costs for compliance with the new arsenic standard (NDWAC, 2001).* This difference is primarily due to the more burdensome residuals management and disposal framework in the state, which results in:

- more onerous disposal permitting requirements accompanied by higher permitting fees and taxes,
- fewer liquid residual discharge options and tighter discharge limits than typically encountered elsewhere in the United States,
- hazardous residuals characterization definitions that are much more rigorous than those used in the remainder of the country, and
- much higher transportation and disposal fees for solid residuals if they are deemed hazardous

Using best available information, it appears that any arsenic treatment technology could produce a residual that would be designated as hazardous in California. Because no treatment facilities have yet been installed in response to the lower arsenic MCL, it is not possible to utilize full-scale experience to compute residuals disposal cost impacts. However, sufficient knowledge exists to quantify the volumes and characteristics of such residuals, and the subsequent cost of disposal.

This study generated the first comprehensive, detailed estimate of residuals production quantities, characterization in terms of potential hazard character, and the disposal costs associated with California water system compliance with a new arsenic MCL statewide. The focus on California provided an opportunity to generate this more detailed assessment given available statewide information resources, and the more stringent hazardous waste criteria strongly affects the overall the cost of compliance for affected utilities. While several attempts have been made to integrate better costing procedures into regional or national cost estimates, the focus has been in the costing of technologies and facilities. Detailed disposal costs have not been evaluated directly by any known researcher or stakeholder, including the USEPA. Therefore, the estimates provided in this report fill a necessary gap in the heretofore efforts of cost estimation.